ERRATA SHEET No. 1

CHANGES TO RESOLUTION NO. R8-2006-0023

Language added to the Resolution released publicly on January 17, 2006 is **underlined and bold**, language deleted is shown as ~~strike-through~~

Resolution title

Resolution Amending the Water Quality Control Plan for the Santa Ana River Basin to Incorporate a Nutrient Total Maximum Daily Load~~s~~ (TMDL~~s~~) for Dry Hydrological Conditions for Big Bear Lake

Finding #7 of Resolution No. R8-2006-0023

7. Big Bear Lake's designated beneficial uses adversely impacted by nuisance aquatic plants and low dissolved oxygen levels include COLD, WARM, WILD, REC1, REC2, and RARE.

Finding #8 of Resolution No. R8-2006-0023

8. As a result of the beneficial use impacts to Big Bear Lake, the Regional Board listed Big Bear Lake as water quality limited in accordance with Section 303(d) of the Clean Water Act. Section 303(d) requires the establishment of a Total Maximum Daily Load (TMDL) for the pollutant(s) causing the impairment. Phosphorus ~~and nitrogen~~ is~~are~~ the principal nutrient~~s~~ causing the impairment. ~~–~~Section 303(d) also requires the allocation of the TMDL among the sources of nutrient inputs. State law requires an implementation plan and schedule to ensure that the TMDL is met and that compliance with water quality standards is achieved.

Finding #9 of Resolution No. R8-2006-0023

9. The Basin Plan amendment shown in the attachment to this Resolution was developed in accordance with Clean Water Act Section 303(d) and Water Code Section 13240 *et seq*. The amendment is proposed for incorporation into Chapter 5 "Implementation", of the Basin Plan. The proposed Basin Plan amendment includes background information concerning the water quality impairment being addressed and the sources of nutrients to Big Bear Lake. The proposed TMDL~~s~~ is~~are~~ supported by a detailed report prepared by Regional Board staff and titled "Staff Report on the Nutrient Total Maximum Daily Loads for Big Bear Lake", June 2005 (hereinafter, "TMDL Report").

Finding #10 of Resolution No. R8-2006-0023

10. The Basin Plan amendment specifies a numeric target~~s~~ for total phosphorus. ~~and total nitrogen~~. Control of ~~nitrogen and~~ phosphorus is one of the potential methods ~~needed~~ to ensure compliance with relevant numeric and narrative water quality objectives specified in the Basin Plan, and to prevent adverse beneficial use impacts resulting from the proliferation of nuisance aquatic plants. There is evidence that nitrogen is the limiting nutrient under certain circumstances and that control of nitrogen inputs may be an additional method to address beneficial use impairment in Big Bear Lake. However, due to data and analytical model limitations, it is infeasible to identify an appropriate and achievable nitrogen TMDL, targets and wasteload and load allocations at this time. The Basin Plan amendment requires

the collection and evaluation of nitrogen data that will support future revision of the TMDL, if and as necessary.

Finding #11 of Resolution No. R8-2006-0023

11. The Basin Plan amendment specifies response numeric targets for chlorophyll *a,* macrophyte coverage and percentage of nuisance aquatic vascular plant species for Big Bear Lake. These response numeric targets provide a method to track improvements in water quality resulting from reductions in the loading of ~~nitrogen and~~ phosphorus.

Finding #13 of Resolution No. R8-2006-0023

13. The Basin Plan amendment specifies a TMDL~~s~~, wasteload allocations for point source discharges (WLAs), load allocations for nonpoint source discharges (LAs) for total phosphorus ~~and total nitrogen~~ for Big Bear Lake for Dry Hydrological Conditions only.

Finding #14 of Resolution No. R8-2006-0023

14. The TMDL~~s~~ for Dry Hydrological Conditions specifies~~y~~ a reduction in ~~nitrogen and~~ phosphorus from internal nutrient sources, which are lake sediment and macrophytes. External load dischargers are responsible for reducing their contributions to the internal nutrient loads.

Finding #15 of Resolution No. R8-2006-0023

15. The TMDL~~s~~ for Dry Hydrological Conditions does not specify nutrient reductions from external watershed sources, which include resorts, urban discharges and open space/forested lands.

Finding #16 of Resolution No. R8-2006-0023

16. The Basin Plan amendment specifies an implementation plan for nutrient reduction. The implementation plan includes compliance schedules for the numeric target~~s~~, TMDL~~s~~, wasteload allocations and load allocations, as well as a monitoring program to track progress toward compliance.

Finding #21 of Resolution No. R8-2006-0023

21. Review of the potential environmental impacts of the adoption and implementation of the Big Bear Lake Nutrient TMDL~~s~~ was conducted. The adoption of the TMDL~~s~~ would have no direct effect on the environment. The implementation of projects that may be conducted to implement the Nutrient TMDL~~s~~ is expected to have less than significant impacts or less than significant impacts with application of mitigation measures on the following: air quality, biological resources, hazards and hazardous materials, hydrology and water quality, noise, aesthetics and transportation and traffic. As projects to implement the TMDL~~s~~ are developed, specific environmental impacts and mitigation measures to address those impacts are subject to thorough and separate evaluation pursuant to the California Environmental Quality Act (CEQA).

Finding #23 of Resolution No. R8-2006-0023

23. The adoption of this~~ese~~ TMDL~~s~~ is necessary to reduce loadings of nutrients to Big Bear Lake and to address water quality impairments that arise therefrom.

Finding #27 of Resolution No. R8-2006-0023

27. The Regional Board discussed this matter at a workshop conducted on August 26, 2005 after notice was given to all interested persons in accordance with Section 13244 of the California Water Code. Based on the discussion at those workshops, the Board directed staff to prepare the appropriate Basin Plan amendment and related documentation to incorporate the Big Bear Lake Nutrient TMDL~~s~~.

Finding #31 of Resolution No. R8-2006-0023

31. The Basin Plan amendment must be submitted for review and approval by the State Water Resources Control Board (SWRCB), Office of Administrative Law (OAL) and U.S. Environmental Protection Agency (USEPA). Once approved by the SWRCB, the amendment is submitted to OAL and USEPA. The Basin Plan amendment will become effective upon approval by OAL ~~and USEPA.~~ A Notice of Decision will be filed.

Finding #33 of Resolution No. R8-2006-0023

33. For the purposes of specifying compliance schedules in NPDES permits for effluent limitations necessary to implement this~~ese~~ TMDL~~s~~, the schedule(s) specified in this~~ese~~ TMDL~~s~~ shall govern, notwithstanding other compliance schedule authorization language in the Basin Plan.

CHANGES TO ATTACHMENT TO RESOLUTION NO. R8-2006-0023

(Language added to the proposed Basin Plan amendment released publicly on January 17, 2006 is **underlined and bold**, language deleted is shown as ~~strike-through~~)

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Initial TMDL development efforts were focused on nutrients, leading to Regional Board adoption of a nutrient TMDL~~s~~ for dry hydrological conditions for Big Bear Lake in 2006. Nutrient TMDLs for wet and/or average hydrological conditions will be incorporated in the Basin Plan when these TMDLs are developed in the future. As shown in Table 5-9a-f, the development of these TMDLs is a requirement of the adopted TMDL implementation plan for the nutrient TMDL~~s~~ for dry hydrological conditions.

Past studies, starting in 1968/1969, have shown that Big Bear Lake is moderately eutrophic and that the limiting nutrient is generally phosphorus.

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As stated above, development of nutrient TMDLs to address these problems was initiated in 2000. In this process, it was recognized that insufficient data for wet or average hydrological conditions were available to allow calibration of the lake water quality model used to calculate the TMDL~~s~~. Accordingly, a TMDL~~s~~ was~~were~~ developed to address dry hydrologic conditions only (see Section 1.B., below). Thi~~se~~ TMDL~~s~~ wa~~sere~~ adopted by the Regional Board in 2006 and became effective on [date]. The implementation plan included with thi~~se~~ TMDL~~s~~ specifies a requirement for the development of nutrient TMDLs for wet and/or average hydrological conditions.

A key step in the development of the nutrient TMDL~~s~~ was the identification of the numeric targets to be achieved. The numeric targets, identified in Section 1.A., below, do not vary based upon hydrological condition. Like the approved TMDL~~s~~ for dry hydrological conditions, the TMDLs for wet and/or average hydrological conditions that will be developed are expected to assure also that these numeric targets are achieved. Indeed, since the TMDL for dry hydrological conditions was developed to meet the targets under the critical, worst-case conditions, consistent compliance with these targets is expected to be achieved even in the absence of TMDLs for wet/average hydrological conditions, given the greater lake volume and dilution anticipated under wetter conditions. ~~,~~ It is recognized that future ~~unless~~ modifications to the targets may be found necessary ~~are demonstrated to be necessary and appropriate.~~

1.A. Numeric Targets

As shown in Table 5-9a-c, both "causal and response" numeric targets are specified for Big Bear Lake. The c~~C~~ausal target~~s~~ is~~are~~ ~~those~~ for phosphorus. ~~and nitrogen, the principal nutrients responsible for plant growth~~. Phosphorus is the primary limiting nutrient in Big Bear Lake. [1] ~~, and nitrogen can be a limiting nutrient under certain conditions~~. Response targets include macrophyte coverage, percentage of nuisance aquatic vascular plant species and chlorophyll *a* concentrations. These response targets are more direct indicators of

[1] There is evidence that nitrogen is a limiting nutrient under certain conditions. However, given data and analytical limitations, no nitrogen targets are specified. Nitrogen monitoring is required as part of this TMDL. The data will be used to specify nitrogen targets in the future, as warranted.

impairment and are specified to assess and track water quality improvements in Big Bear Lake.

A weight of evidence approach will be used to assess compliance with the TMDL~~s~~, which means that data pertaining to all the numeric targets will be evaluated and non-compliance with one target will not automatically imply non-compliance with the TMDL~~s~~.

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Table 5-9a-c
Big Bear Lake Nutrient TMDL Numeric Targets[a]

Indicator	Target Value
Total P concentration	Annual average[b] no greater than 35 µg/L; to be attained no later than 2015 (dry hydrological conditions~~season~~), 2020 (all other times)[c]
~~Total N concentration~~	~~Annual average[b] no greater than 1000 µg/L; to be attained no later than 2015 (dry season), 2020 (all other times)~~
Macrophyte Coverage	30-~~4~~60% on a total lake area basis; to be attained by 2015 (dry hydrological conditions~~season~~), 2020 (all other times) [c,d]
Percentage of Nuisance Aquatic Vascular Plant Species	95% eradication on a total area basis of Eurasian Watermilfoil and any other invasive aquatic plant species; to be attained no later than 2015 (dry hydrological conditions~~season~~), 2020 (all other times) [c, d]
Chlorophyll *a* concentration	Growing season[~~d~~e] average no greater than 14 µg/L; to be attained no later than 2015 (dry hydrological conditions~~season~~), 2020 (all other times)[c]

[a] Compliance with the targets to be achieved as soon as possible, but no later than the date specified

[b] Annual average determined by the following methodology: the nutrient data from both the photic composite and discrete bottom samples are averaged by station number and month; a calendar year average is obtained for each sampling location by averaging the average of each month; and finally, the separate annual averages for each location are averaged to determine the lake-wide average. The open-water sampling locations used to determine the annual average are MWDL1, MWDL2, MWDL6, and MWDL9 (see 1.B.4. Implementation, Task 4.2, Table 5-9a-i).

[c] Compliance date for wet and/or average hydrological conditions may change in response to approved TMDLs for wet/average hydrological conditions. ~~is subject to confirmation by when TMDLs are developed for these conditions.~~

[d~~e~~] Calculated as a 5-yr running average based on measurements taken at peak macrophyte growth as determined in the Aquatic Plant Management Plan (see 1.B.4. Implementation, Task 6C)

[e~~d~~] Growing season is the period from May 1through October 31 of each year. The open-water sampling locations used to determine the growing season average are MWDL1, MWDL2, MWDL6 and MWDL9 (see 1.B.4. Implementation, Task 4.2, Table 5-9a-i). The chlorophyll *a* data from the photic samples are averaged by station number and month; a growing season average is obtained for each sampling location by averaging the average of each month; and finally, the separate growing season averages for each location are averaged to determine the lake-wide average.

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1.B. Big Bear Lake Nutrient Total Maximum Daily Load~~s~~ (TMDL~~s~~) for Dry Hydrological Conditions

The TMDL technical report [Ref. #1] describes in detail the technical basis for the TMDL~~s~~ for Dry Hydrological Conditions that follow.

1.B.1. Nutrient TMDL~~s~~, WLAs and LAs and Compliance Dates – Dry Hydrological Conditions

A TMDL~~s~~, and the WLAs and LAs necessary to achieve it~~them~~, are established for total phosphorus ~~and total nitrogen~~ for dry hydrological conditions only.

The phosphorus ~~and nitrogen~~ TMDL~~s~~ for Big Bear Lake for dry hydrological conditions is~~are~~ shown in Table 5-9a-d.

Table 5-9a-d

Big Bear Lake Nutrient TMDL~~s~~ for Dry Hydrological Conditions

	Total Phosphorus (lbs/yr) [b]	~~**Total Nitrogen (lbs/yr)**~~ [~~b~~]
TMDL[a]	26,012	~~280,900~~

[a] Compliance to be achieved as soon as possible, but no later than December 31, 2015.

[b] Specified as an annual average for dry hydrological conditions only.

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Table 5-9a-e

Big Bear Lake
~~Nitrogen and~~ Phosphorus Wasteload and Load Allocations for Dry Hydrological Conditions

Big Bear Lake Nutrient TMDL for Dry Hydrological Conditions ~~Nutrient TMDLs~~	Total Phosphorus Load Allocation (lbs/yr)[a, b]	~~Total Nitrogen Load Allocation (lbs/yr)~~ [a, b,]
TMDL	**26,012**	**~~280,900~~**
WLA	**475**	**~~3,445~~**
Urban	475	~~3,445~~
LA	**25,537**	**~~277,455~~**
Internal Sediment	8,555	~~152,386~~
Internal macrophyte	15,700	~~102,324~~
Atmospheric Deposition	1,074	~~21,474~~
Forest	175	~~460~~
Resort	33	~~811~~

[a] Allocation compliance to be achieved as soon as possible, but no later than December 31, 2015.
[b] Specified as an annual average for dry hydrological conditions only.

1.B.2. Margin of Safety

The Big Bear Lake Nutrient TMDL~~s~~ for Dry Hydrological Conditions includes an implicit margin of safety (MOS) as follows:

1.B.3. Seasonal Variations/Critical Conditions

This~~ese~~ nutrient TMDL~~s~~ for Big Bear Lake is~~are~~ focused on the critical dry hydrological conditions and, in particular, on the control of the internal sediment loads that dominate during these periods. This~~ese~~ is~~are~~ the first phase of TMDLs needed to address

eutrophication in Big Bear Lake. The next phase will include collection of data needed to refine the in-lake and watershed models (see 1.B.4. TMDL Implementation, Task 6A) and to develop TMDLs that address other hydrological conditions (see 1.B.4. TMDL Implementation, Task 9). TMDLs for wet and average hydrological conditions will be developed to address external loading that contributes to the nutrient reservoir in the lake and thus eutrophic conditions, particularly during the critical dry periods. However, it is important to note again that since the TMDL for dry hydrological conditions was developed to meet the numeric targets under the critical, worst-case conditions, consistent compliance with these targets is expected to be achieved even in the absence of TMDLs for wet/average hydrological conditions, given the greater lake volume and dilution anticipated under wetter conditions.

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The TMDL~~s~~ recognizes that different nutrient inflow and cycling processes dominate the lake during different seasons. These processes were simulated in the in-lake model using data collected during all seasons over a multi-year period**.** Thus, the model results reflect all seasonal variations. The phosphorus numeric target~~s~~ is~~are~~ expressed as an annual average, while the chlorophyll *a* target is expressed as a growing season average~~s~~. The intent is to set targets that will, when achieved, result in improvement of the trophic status of ~~the~~ Big Bear Lake year-round.

1.B.4. TMDL Implementation

Table 5-9a-f outlines the tasks and schedules to implement the TMDL~~s~~ for Dry Hydrological Conditions. Each of these tasks is described below.

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Table 5-9a-f

Big Bear Lake Nutrient TMDL Implementation
Plan/Schedule Report Due Dates

Task	**Description**	**Compliance Date-As soon As Possible but No Later Than**
TMDL Phase 1		
Task 1	Establish New Waste Discharge Requirements for Nutrient Sources	*(*6 months after BPA approval*)*
Task 2	Establish New Waste Discharge Requirements for Lake Restoration Activities	*(*18 months after BPA approval*)*
Task 3	Revise Existing Waste Discharge Requirements	*(*6 months after BPA approval*)*

Task 4	Nutrient Water Quality Monitoring Program 4.1 Watershed-wide Nutrient Monitoring Plan(s) 4.2 Big Bear Lake Nutrient Monitoring Plan(s)	Plan/schedule due *(*3 months after BPA approval*)* Annual reports due February 15
Task 5	Atmospheric Deposition Determination	Plan/schedule due *(*1 year after BPA approval*)*
Task 6	Big Bear Lake – Lake Management Plan, including: 6A. Big Bear Lake and Watershed Model Updates 6B. Big Bear Lake In-Lake Sediment Nutrient Reduction Plan 6C. Big Bear Lake Aquatic Plant Management Plan	Plan/schedule due *(*1 year after BPA approval*)* Annual reports due February 15
TMDL Phase 2		
Task 7	Review/Revision of Big Bear Lake Water Quality Standards 7.1 Review/Revise Nutrient Water Quality Objectives 7.2 Development of biocriteria 7.3 Development of natural background definition	December 31, 2015
Task 8	Review Big Bear Lake Tributary Data	December 31, 2008
Task 9	Develop TMDLs, WLAs and LAs for wet and/or average hydrological conditions	December 31, 2012
Task 10	Review of TMDL~~s~~/WLAs/LAs	Once every 3 years

[Note: BPA => Basin Plan Amendment

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Task 1: Establish New Waste Discharge Requirements for Nutrient Sources

1.1 Waste Discharge Requirements (WDRs) or Conditional Waiver of WDRS to the Big Bear Mountain Resorts to incorporate the nutrient load allocations, compliance schedule and monitoring and reporting requirements.[2]

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[2] The Regional Board may find that for regulatory purposes, including those of this TMDL, the Big Bear Mountain Resorts are under the jurisdiction of San Bernardino County and/or the City of Big Bear Lake and are or can be appropriately addressed by the terms and conditions of the MS4 permit issued for San Bernardino County (see Task 3, 3.1). Where necessary, appropriate changes to the MS4 permit to assure appropriate regulatory coverage can be considered. Under these circumstances, individual waste discharge requirements or a conditional waiver therefrom for the Big Bear Mountain Resorts would not be necessary.

Task 4: Monitoring

4.1 Watershed-wide Nutrient Water Quality Monitoring Program

No later than (**3 months from effective date of this Basin Plan amendment* *), the US Forest Service, the State of California, Department of Transportation (Caltrans), the County of San Bernardino, San Bernardino County Flood Control District, the City of Big Bear Lake and Big Bear Mountain Resorts shall, as a group, submit to the Regional Board for approval a proposed watershed-wide nutrient monitoring program that will provide data necessary to review and update the Big Bear Lake Nutrient TMDL~~s~~, to determine specific sources of nutrients and to develop TMDLs for other hydrological conditions. Data to be collected and analyzed shall address, at a minimum, determination of compliance with the ~~nitrogen and~~ phosphorus dry condition TMDL~~s~~, including the WLAs and LAs, and with the existing total inorganic nitrogen (TIN) objective.

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An annual report summarizing the data collected for the year and evaluating compliance with the TMDL/WLAs/LAs shall be submitted by February 15 of each year.

In lieu of this coordinated monitoring plan, one or more of the parties identified above may submit a proposed individual or group monitoring plan for Regional Board approval. Any such individual or group monitoring plan is due no later than (*3 *months from effective date of this Basin Plan amendment**) and shall be implemented upon Regional Board approval at a duly noticed public meeting. An annual report of data collected pursuant to approved individual/group plan(s) shall be submitted by February 15 of each year. The report shall summarize the data and evaluate compliance with the TMDL/WLAs/LAs.

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4.2 Big Bear Lake: In-Lake Nutrient Monitoring Program

No later than (**3 months from effective date of this Basin Plan amendment* *), the US Forest Service, the State of California, Department of Transportation (Caltrans), the County of San Bernardino, San Bernardino County Flood Control District, the City of Big Bear Lake, and Big Bear Mountain Resorts shall, as a group, submit to the Regional Board for approval a proposed Big Bear Lake nutrient monitoring program that will provide data necessary to review and update the Big Bear Lake Nutrient TMDL~~s~~, and to develop TMDLs for other hydrological conditions. Data to be collected and analyzed shall address, at a minimum: (1) determination of compliance with ~~nitrogen~~, phosphorus and chlorophyll *a* numeric targets; (2) determination of compliance with the existing total inorganic nitrogen (TIN) objective; and (3~~2~~) refinement of the in-lake model for the purposes of TMDL review and development.

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The monitoring plan shall be implemented upon Regional Board approval at a duly noticed public meeting. An annual report summarizing the data collected for the year and evaluating compliance with the TMDL~~s~~/WLAs/LAs and numeric targets shall be submitted by February 15 of each year.

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In lieu of this coordinated monitoring plan, one or more of the parties identified above may submit a proposed individual or group monitoring plan for Regional Board approval. Any such individual or group monitoring plan is due no later than (*3 *months from effective date of this Basin Plan amendment* *) and shall be implemented upon Regional Board approval at a duly noticed public meeting. An annual report of data collected pursuant to approved individual/group plan(s), shall be submitted by February 15 of each year. The report shall summarize the data and evaluate compliance with the TMDL/WLAs/LAs and numeric targets.

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Task 6: Big Bear Lake – Lake Management Plan

The Big Bear Lake – Lake Management Plan shall be implemented upon Regional Board approval at a duly noticed public meeting. Once approved, the plan shall be reviewed and revised as necessary at least once every three years. The review and revision shall take into account assessments of the efficacy of control/management strategies implemented and relevant requirements of new or revised TMDLs for Big Bear Lake and its watershed. An annual report summarizing the data collected for the year and evaluating compliance with the TMDL~~s~~/WLAs/LAs and numeric targets shall be submitted by February 15 of each year.

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In lieu of this coordinated plan, one or more of the parties identified above may submit a proposed individual or group Big Bear Lake – Lake Management Plan and schedule for approval by the Regional Board. Any such individual or group plan must conform to the requirements specified above and is due no later than *(* 1 year from effective date of the Basin Plan amendment*)*.* An individual or group plan shall be implemented upon Regional Board approval at a duly noticed public meeting. An annual report summarizing the data collected for the year and evaluating compliance with the TMDL~~s~~/WLAs/LAs and numeric targets shall be submitted by February 15 of each year.

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Task 10: Review/Revision of the Big Bear Lake Nutrient TMDL for Dry Hydrological Conditions ~~Nutrient TMDL~~ (TMDL "Re-opener")

The basis for the TMDL for Dry Hydrological Conditions, ~~TMDLs and~~ the implementation plan and schedule will be re-evaluated at least once every three years[3~~1~~] to determine the need for modifying the allocations, numeric targets and TMDL~~s~~. Regional Board staff will continue to review all data and information generated pursuant to the TMDL requirements on an ongoing basis. Based on results generated through the monitoring programs, special studies and/or modeling analyses, changes to the TMDL~~s~~ may be warranted. Such changes will be considered through the Basin Plan Amendment process.

[3~~1~~] ~~The~~ three-year schedule is tied to the 3 year triennial review schedule.

The Regional Board is committed to the review of thi~~s~~is~~ese~~ TMDL~~s~~ every three years, or more frequently if warranted by these or other studies.